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EXAMINER

HSIEH, SHIH WEN

ART UNIT

PAPER NUMBER

2861

DATE MAILED: 06/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/689,761

Applicant(s)

SUZUKI, KAZUNAGA

Examiner

Shih-wen Hsieh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,9-19,21 and 26-34 is/are rejected.
- 7) ☒ Claim(s) 3,5-8,20 and 22-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 4, 18, 19, 21, 33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii et al. (US Pat. No. 5,572,242).

In regard to:

Claim 1:

Fujii et al. teach:

A liquid jetting apparatus comprising:

a head (1, fig. 1) having a nozzle (col. 7, lines 21-22), adapted to receive jetting data corresponding to one scanning movement in a main scanning direction (arrow, fig. 16), refer to col. 4, lines 7-10;

a head-scanning mechanism (2, fig. 1) for moving the head in the main scanning direction after the head has received the jetting data, refer to col. 7, lines 24-33;

a recovering unit (250 and 251, fig. 16) for recovering a suitable viscosity of liquid in the nozzle from an increased viscosity thereof, refer to col. 8, lines 46-48;

a measuring timer (4, fig. 1) for measuring at least a part of a time since a previous operation of the recovering unit has been completed, refer to S1, S2 and S7, fig. 3A , also refer to col. 8, line 34+; and

a controller (6, fig. 1) for controlling the recovering unit, based on the time measured by the measuring timer, refer to col. 7, line 62 to col. 8, line 7.

Claim 2:

Fujii et al. further teach:

wherein the measuring timer is adapted to measure a time since the previous operation of the recovering unit has been completed until the head completes receiving the jetting data, refer to S1 for the completion of a previous recovery operation and S3 for the receiving of a print signal/command, which corresponds to the jetting data; and S4, where the time is reset.

Claim 4:

Fujii et al. further teach:

wherein the controller is adapted to control the recovering unit, based on the jetting data, refer to fig. 3A, e.g., in S5, when the printing is completed, the carriage returns to the standby position (co. 9, line1 19-24), if the printing is continued at step S8, the process then returns to S2 again, the maintenance process before printing is the

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same as the first printing process, therefore, the controller controls the recovery process based on the print command or the jetting data in the instant application.

Claim 18:

A controlling unit for controlling a liquid jetting apparatus including: a head having a nozzle, adapted to receive jetting data corresponding to one scanning movement in a main scanning direction; a head-scanning mechanism for moving the head in the main scanning direction after the head has received the jetting data; a recovering unit for recovering a suitable viscosity of liquid in the nozzle from an increased viscosity thereof; and a measuring timer for measuring at least a part of a time since a previous operation of the recovering unit has been completed; wherein

the controlling unit is adapted to control the recovering unit, based on the time measured by the measuring timer.

Rejection:

This claim is rejected on the basis as set forth for claim 1 discussed above.

Claim 19:

A controlling unit according to claim 18, wherein: the measuring timer is adapted to measure a time since the previous operation of the recovering unit has been completed until the head completes receiving the jetting data.

Rejection:

This claim is rejected on the basis as set forth for claim 2 discussed above.

Claim 21:

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A controlling unit according to claim 18, wherein the controlling unit is adapted to control the recovering unit, based on the jetting data.

Rejection:

This claim is rejected on the basis as set forth for claim 4 discussed above.

Claim 33:

A storage unit capable of being read by a computer, storing a program for materializing a controlling unit for controlling a liquid jetting apparatus including; a head having a nozzle, adapted to receive jetting data corresponding to one scanning movement in a main scanning direction; a head-scanning mechanism for moving the head in the main scanning direction after the head has received the jetting data; a recovering unit for recovering a suitable viscosity of liquid in the nozzle from an increased viscosity thereof; and a measuring timer for measuring at least a part of a time since a previous operation of the recovering unit has been completed; wherein the controlling unit is adapted to control the recovering unit, based on the time measured by the measuring timer.

Rejection:

This claim is rejected on the basis as set forth for claim 1 discussed above.

Storing unit such as a ROM (103, fig. 2 in Fujii et al.'s invention) is usually used to store a control program, printing operation procedures, etc.

Claim 34:

A storage unit capable of being read by a computer, storing a program including a command for controlling a second program executed by a computer system including

a computer, the program is executed by the computer system to control the second program to materialize a controlling unit for controlling a liquid jetting apparatus including; a head having a nozzle, adapted to receive jetting data corresponding to one scanning movement in a main scanning direction; a head-scanning mechanism for moving the head in the main scanning direction after the head has received the jetting data; a recovering unit for recovering a suitable viscosity of liquid in the nozzle from an increased viscosity thereof; and a measuring timer for measuring at least a part of a time since a previous operation of the recovering unit has been completed; wherein the controlling unit is adapted to control the recovering unit, based on the time measured by the measuring timer.

Rejection:

This claim is rejected on the basis as set forth for claims 1 and 33 discussed above. As discussed above for claim 33, A ROM stores a number of programs, programs such as shown in figs. 3 and 5, etc. in Fujii et al.'s invention are controlled by a command so as to allow the flow diagrams to be executed step by step.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9-13 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Koitabashi et al. (US Pat. No. 5,495,271).

In regard to:

Claim 9:

The device of Fujii et al. DIFFERS from claim 9 in that it does not teach:

wherein the controller is adapted to control the recovering unit, dependently on a proportion of the liquid jetted in a previous scanning movement in the main scanning direction.

Koitabashi et al. teach a suction recovery operation after a page has been printed, the sucking force for the suction recovery operation (forced discharge) is changed between a large scale recovery and a small scale recovery, if the large scale recovery is executed, and the ink left in an ink container is consumed to such an extend that the remaining amount of ink is small, air in the ink container maybe introduced into the liquid passages in the form of bubbles. Therefore, small sucking force is used. Since each printing job, e.g., completing a line printing or a page printing consumes ink, as the printing job goes on, the amount of remaining ink becomes less and less. Therefore, Koitabashi et al. teach a recovery operation with varying suction forces based on the amount of remaining ink or depends on the previous ink jetted in the printing jobs, refer to col. 16, line 52 to col. 17, line 57.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Fujii et al. to include a

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recovery controlled method as taught by Koitabshi et al. for the purpose of controlling suction recovery operation in varying pressure based on remaining ink quantity.

Claim 10:

The device of Fujii et al. DIFFERS from claim 10 in that it does not teach:

wherein the head has a plurality of nozzles, the recovering unit is adapted to recover a suitable viscosity of liquid in each of the plurality of nozzles from an increased viscosity thereof, respectively, and the controller is adapted to control the recovering unit, dependently on respective proportions of the liquid jetted from the respective nozzles in a previous scanning movement in the main scanning direction.

Koitabashi et al. further teach in their fig. 19 that a plurality of print heads (corresponding to a head has a plurality of nozzles) each has different recovery setting (such as NA-ND, TA-TD and FA-FD, fig. 19), the controlling of this different recovery operations (in this case, an idle ejection) is determined in consideration of the different color ink material mixture by the cleaning after the printing operation, refer to col. 18, lines 7-63.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Fujii et al. to include different idle ejections for an ink jet printer having a plurality of nozzles jetting different color ink so as to reduce color ink mixture to the least.

Claim 11:

A liquid jetting apparatus according to claim 4, wherein the controller is adapted to control the recovering unit, dependently on a proportion of the liquid jetted in a next

scanning movement in the main scanning direction, based on the jetting data corresponding to the next scanning movement.

Rejection:

A printing job may include a plurality of carriage movements in the main scanning, the previous scanning movement or the next scanning movement are all included in the printing job. Therefore, this claim is rejected on the basis as set forth for claim 9 discussed above.

Claim 12:

A liquid jetting apparatus according to claim 4, wherein: the head has a plurality of nozzles, the recovering unit is adapted to recover a suitable viscosity of liquid in each of the plurality of nozzles from an increased viscosity thereof, respectively, and the controller is adapted to control the recovering unit, dependently on respective proportions of the liquid jetted from the respective nozzles in a next scanning movement in the main scanning direction, based on the jetting data corresponding to the next scanning movement.

Rejection:

This claim is rejected on the basis as set forth for claims 10 and 11 discussed above.

Claim 13:

A liquid jetting apparatus according to claim 1, wherein the head has a plurality of nozzles in which a plurality of kinds of liquid are used, respectively, the recovering unit is adapted to recover a suitable viscosity of liquid in each of the plurality of nozzles from

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an increased viscosity thereof, respectively, and the controller is adapted to control the recovering unit, based on characteristics of the respective kinds of liquid used in the respective nozzles.

Rejection:

This claim is rejected on the basis as set forth for claims 10 and 12 discussed above.

Claim 26:

A controlling unit according to claim 21, wherein the controlling unit is adapted to control the recovering unit, dependently on a proportion of the liquid jetted in a previous scanning movement in the main scanning direction.

Rejection:

This claim is rejected on the basis as set forth for claim 9 discussed above.

Claim 27:

A controlling unit according to claim 21, wherein the head has a plurality of nozzles, the recovering unit is adapted to recover a suitable viscosity of liquid in each of the plurality of nozzles from an increased viscosity thereof, respectively, and the controlling unit is adapted to control the recovering unit, dependently on respective proportions of the liquid jetted from the respective nozzles in a previous scanning movement in the main scanning direction.

Rejection:

This claim is rejected on the basis as set forth for claim 10 discussed above.

Claim 28:

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A controlling unit according to claim 21, wherein the controller is adapted to control the recovering unit, dependently on a proportion of the liquid jetted in a next scanning movement in the main scanning direction, based on the jetting data corresponding to the next scanning movement.

Rejection:

This claim is rejected on the basis as set forth for claim 11 discussed above.

Claim 29:

A controlling unit according to claim 21, wherein the head has a plurality of nozzles, the recovering unit is adapted to recover a suitable viscosity of liquid in each of the plurality of nozzles from an increased viscosity thereof, respectively, and the controlling unit is adapted to control the recovering unit, dependently on respective proportions of the liquid jetted from the respective nozzles in a next scanning movement in the main scanning direction, based on the jetting data corresponding to the next scanning movement.

Rejection:

This claim is rejected on the basis as set forth for claim 12 discussed above.

Claim 30:

A controlling unit according to claim 18, wherein the head has a plurality of nozzles in which a plurality of kinds of liquid are used, respectively, the recovering unit is adapted to recover a suitable viscosity of liquid in each of the plurality of nozzles from an increased viscosity thereof, respectively, and the controlling unit is adapted to control

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the recovering unit, based on characteristics of the respective kinds of liquid used in the respective nozzles.

Rejection:

This claim is rejected on the basis as set forth for claim 13 discussed above.

6. Claims 14 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Yaegashi et al. (US Pat. No. 6,193,351 B1).

In regard to:

Claim 14:

The device of Fujii et al. DIFFERS from claim 14 in that it does not teach:

a sensor for detecting a state of environment where the liquid jetting apparatus is used, wherein

the controller is adapted to control the recovering unit, based on an output from the sensor.

Yaegashi et al. teach an ink jet head recovery method, in which an environmental temperature detecting means (39, fig. 1) is used to measure the temperature surrounding the head, and base on a temperature difference between the environmental temperature and the head temperature, a head recovery operation is then carried out, refer to fig. 1.

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Fujii et al. to include an environmental temperature detecting means as taught by Yaegashi et al. for the

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purpose of activating head recovery operation to cope with the environmental temperature.

Claim 31:

A controlling unit according to claim 18, wherein: the liquid jetting apparatus further includes a sensor for detecting a state of environment where the liquid jetting apparatus is used, and the controlling unit is adapted to control the recovering unit, based on an output from the sensor.

Rejection:

This claim is rejected on the basis as set forth for claim 14 discussed above.

7. Claims 15 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al.

In regard to:

Claim 15:

Fujii et al. teach an ink holder (250, fig. 16) holds an ink absorber (251) for absorbing ejected ink during head recovery process. Fujii et al. do not specifically teach a cap, which is a device having a cavity to hermetically seal the head, the timing for the cap to seal the head can be based on an elapsed time, number of ink dot being discharged, number of pages being printed, etc., refer to MPEP 2144.03, In re Malcolm, 129 F.2d 529, 54 USPQ 235 (CCPA 1942).

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Fujii et al. to include a cap as

most of the ink jet printer used to have one for the purpose of sealing the head to prevent ink in the nozzle(s) from drying.

Claim 32:

A controlling unit according to claim 18, wherein
the liquid jetting apparatus further includes a capping unit capable of being moved between a position away from the head and a position for coming in contact with the head in order to seal the nozzle, and

the controlling unit is adapted to bring the capping unit in contact with the head, based on the time measured by the measuring timer.

Rejection:

This claim is rejected on the basis as set forth for claim 15 discussed above.

8. Claims 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii et al. in view of Kobayashi et al. (US Pat. No. 6,036,299).

In regard to;

Claim 16:

The device of Fujii et al. DIFFERS from claim 16 in that it does not teach:
wherein the recovering unit is a minutely-vibrating unit for causing the liquid in the nozzle to minutely vibrate.

Kobayashi et al. teach an ink jet recording apparatus having a small vibration controlling means (24, fig. 2), refer to col. 4, lines 10-12 and col. 11, lines 11-21.

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Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the device of Fujii et al. to include a small vibration controlling means as taught by Kobayashi et al. for the purpose of promoting bubbles dissolution into the ink by a small vibration of the carriage caused by the small vibration controlling means.

Claim 17:

Fujii et al. teach:

wherein the recovering unit is a flushing unit (251, fig. 16, Fujii et al. called it an ink absorbing, and a flushing operation is an ink discharged operation by applying a signal to the head causing ink discharging, which is not used for printing) for causing the liquid in the nozzle to jet out from the nozzle outside an objective jetting area, refer to col. 4, lines 51-67.

Allowable Subject Matter

9. Claims 3, 5-8, 20 and 22-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

In regard to:

Claims 3 and 20:

The primary reason for the allowance of claims 3 and 20 is the inclusion of the limitations of wherein the head-scanning mechanism is adapted to move the head from a waiting position in the main scanning direction after the head has received the jetting data, and to move back the head to the waiting position again, and the measuring timer is adapted to measure a time since the head has been moved back to the waiting position again after being moved in the main scanning direction until the head completes receiving the jetting data. It is these limitations found in these claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Claims 5 and 22:

The primary reason for the allowance of claims 5 and 22 is the inclusion of the limitations of wherein the head-scanning mechanism is adapted not to move the head to an area over a position to which a last drop of the liquid is jetted in the one scanning movement in the main scanning direction, and the controller is adapted to control the recovering unit, dependently on a distance for which the head is moved in a next scanning movement in the main scanning direction, based on the jetting data corresponding to the next scanning movement. It is these limitations found in these claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Claims 6 and 23:

The primary reason for the allowance of claims 6 and 23 is the inclusion of the limitations of wherein the head-scanning mechanism is adapted not to move the head to an area over a position to which a last drop of the liquid is jetted in the one scanning movement in the main scanning direction, and the controller is adapted to control the recovering unit, dependently on a distance for which the head has been moved in a previous scanning movement in the main scanning direction. It is these limitations found in these claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Claims 7 and 24:

The primary reason for the allowance of claims 7 and 24 is the inclusion of the limitation of wherein the controller is adapted to control the recovering unit, dependently on a distance for which the head is moved until a first drop of the liquid is jetted in a next scanning movement in the main scanning direction, based on the jetting data corresponding to the next scanning movement. It is this limitation found in these claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Claims 8 and 25:

The primary reason for the allowance of claims 8 and 25 is the inclusion of the limitation of wherein the controller is adapted to control the recovering unit, dependently on respective distances for which the head is moved until respective first drops of the liquid are jetted from the respective nozzles in a next scanning movement in the main


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scanning direction, based on the jetting data corresponding to the next scanning movement. It is this limitation found in these claims, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-wen Hsieh whose telephone number is 703-305-4961. The examiner can normally be reached on 7:30AM -5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Fuller can be reached on 703-308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Shih-wen Hsieh
Primary Examiner
Art Unit 2861

SWH


June 24, 2003